



**GEOLOGICAL MAPPING AND GEOCHEMICAL SAMPLING  
AT RICO, COLORADO  
OCTOBER, 1995**

**Prepared For:**

**TITAN ENVIRONMENTAL CORPORATION**

**Prepared By:**

**Michael D. Russ  
Consulting Geologist**

**January, 1996**

REPORT ON GEOLOGICAL MAPPING AND GEOCHEMICAL SAMPLING  
AT RICO, COLORADO  
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PURPOSE

The purpose of the geological mapping and geochemical sampling conducted for Titan Environmental Corporation in the Rico townsite was to determine if concentrations of selected metals in surficial deposits are the result of erosion and concentration of naturally occurring geologic sources, or the result of human activity.

SCOPE OF WORK

GEOLOGICAL MAPPING

A geological map (Plate 1) was produced at a scale of: 1 inch = 50 feet, covering the Rico townsite north of Silver Creek. Field mapping was conducted during a one week period in October 1995. The geological map shows rock outcrops, surficial deposits (with the exception of colluvial deposits), structure, hydrothermal alteration and mineralization (metallization). Due to limited exposures in the map area, many of the formation contacts and several geologic faults are reproduced from U.S. Geological Survey mapping in the Rico mining district (McKnight, 1974). Several new map units were created that do not appear on the U.S.G.S. mapping. Two of the new map units, younger Quaternary Fan deposits (Qfy) and Quaternary alluvial terrace deposits (Qat), are local subdivisions of Quaternary fan deposits (Qf) shown on the U.S.G.S mapping (McKnight, 1974). The other new map units are divisions of the Hermosa Formation, Lower Member, into sandstone, shale and limestone units.

A surficial geology map (Plate 2) at a scale of 1 inch = 50 feet, was produced in conjunction with the geological map, and covers the same area of the Rico townsite. The surficial geology map shows rock outcrops, sulfide mineralization, and surficial deposits. The map includes several subdivisions of surficial deposits not shown on the geological map (Plate 1). It also designates the areas where surficial deposits have been disturbed by human activities (see description for surficial disturbance, Plate 2).

GEOCHEMICAL SAMPLING

A total of 46 samples from both rock outcrops and unconsolidated surficial deposits were collected and analyzed for arsenic (As), cadmium (Cd), copper (Cu), Lead (Pb), Manganese (Mn), silver (Ag), and zinc (Zn) content. The average sample weight was approximately five pounds. Samples were selected to be representative of specific rock and surficial deposit types in the Rico townsite. A detailed description of each sample is included with this report (Appendix A).

Large rock outcrops were sampled using a geologist's pick to collect rock chips along a continuous line across the outcrop. This method was used to obtain a sample approximating the average material in the outcrop. The sample interval width is noted in the sample descriptions (Appendix A), and shown on both geology maps by interval lines with sample numbers. Smaller rock outcrops were sampled by collecting rock chips randomly from around the outcrop. These samples are shown on both maps as circles with sample number.

Samples of surficial deposits were collected using a geologists pick to either excavate a small hole from which a sample could be obtained or by gouging unconsolidated material from the wall of a pre-existing excavation. An attempt was made to collect material from a vertical interval of at least six inches. Samples were collected in heavy gauge (4 mil) plastic bags.

## PHOTOGRAPHIC DOCUMENTATION

Sample locations, where possible, were photographed showing the sample number in each picture and a geologist's pick for scale. A few samples were not photographed due to snow cover. A set of the sample location photographs is included in Appendix B of this report.

## RICO TOWNSITE GEOLOGY

### STRATIGRAPHY AND STRUCTURE

The Rico townsite is located on the south flank of the east-west trending Rico structural dome (Pratt, 1969). The townsite is underlain by a southeast dipping sequence of Paleozoic age sedimentary rocks intruded by sills and dikes of hornblende latite porphyry. The Paleozoic sequence and hornblende latite porphyry are offset by geologic faults trending east, northeast, and northwest. These faults are poorly exposed in the map area and are approximately located beneath surficial deposits. The Mississippian age Leadville Limestone is the oldest rock formation exposed in the map area. It outcrops at the north end of Rico, in Silver Creek near the Atlantic Cable Mine, and on the west bank of the Dolores River. In outcrop, the Leadville is pervasively metamorphosed to gray, brecciated marble containing pods and irregular lenses of metamorphic silicate minerals, chert, and iron oxides.

The Pennsylvanian age Larsen Quartzite overlies the Leadville Limestone and outcrops in road cuts northeast of town; along an inferred fault north of town; and on the west bank of the Dolores River. The Larsen Quartzite is dark reddish-gray, fine to coarse grained, and weakly bedded. Visible sulfide mineralization in the Larsen outcrops consists of narrow quartz-pyrite veinlets and sparse disseminated pyrite.

The Larsen Quartzite is overlain to the southeast by the Lower Member of the Pennsylvanian age Hermosa Formation. The Hermosa Formation, Lower Member, underlies a large portion of the Rico townsite in the map area. The Hermosa Formation, Lower Member, consists of a basal unit composed of dark green, fine-grained sandstone. The sandstone unit is

poorly exposed in an outcrop on Silver Street and in Silver Creek. Visible sulfide mineralization in the sandstone unit consists of narrow quartz-pyrite veinlets and sparse disseminated pyrite.

The sandstone unit is overlain by a thick sequence of shale and limestone. The Lower Hermosa shale is exposed in outcrops above the Van Winkle Shaft. Where exposed, the shale is dark gray, brittle, and badly shattered, with strong manganese and iron oxides coating fractures. A limestone unit of the Hermosa Formation, Lower Member, outcrops on the north bank of Silver Creek near the Van Winkle Shaft. In outcrop, the limestone is dark gray, carbonaceous, and thick bedded, with euhedral pyrite cubes up to five millimeters in size, and a few quartz-calcite-pyrite veinlets.

In the Rico townsite, the Cretaceous-Tertiary age hornblende latite porphyry occurs as sills and dikes, predominantly intruding the Hermosa Formation, Lower Member. In outcrops throughout the map area, the latite porphyry is pervasively dark green, chloritized and pyritized. In outcrops on the west bank of the Dolores River, the latite porphyry contains 5 to 10 percent coarse, disseminated pyrite. Visible lead mineralization occurs in outcrops east of town as quartz-pyrite-galena veins and veinlets up to one inch thick.

## SULFIDE MINERALIZATION

The Rico townsite is located within an extensive area of lead-zinc-silver sulfide mineralization known as the Rico mining district. The sulfide mineralization formed during a four million year b.p. thermal event related to the emplacement of an unexposed igneous mass approximately one mile northeast of the Rico townsite. Metals transported in hydrothermal solutions were deposited as sulfide minerals primarily in carbonate host rocks (hence the term "carbonate camp" in reference to Rico). Sulfide minerals were observed in all rock outcrops in the map area. Pyrite, the most commonly observed sulfide, occurs in every rock type.

In addition to the outcropping sulfide mineralization described above, two large Pb-Zn-Fe-Cu ore bodies and several smaller ore bodies occurred beneath the Rico townsite. They were mined underground through the Atlantic Cable mine and the Van Winkle Shaft. The ore bodies were high grade concentrations of pyrite, galena, sphalerite, and chalcopyrite, together with gang minerals, such as calcite, quartz and hematite, that formed minable bodies of rock. The ore bodies occurred as contact metamorphic deposits and replacement deposits in the Leadville Limestone. The sulfide ore bodies at the Atlantic Cable mine outcropped at two locations near the Atlantic Cable shaft and were mined from the surface to a depth of 183 feet. A second large sulfide ore body occurred midway between the Atlantic Cable shaft and the Van Winkle Shaft. The apex of this ore body is not known. Mine maps indicate the ore body was accessed via tunnels approximately 200 feet below the surface.

## SURFICIAL DEPOSITS

The surficial geology map (Plate 2) shows the areal extent of rock outcrops and unconsolidated surficial deposits in the northern portion of the Rico townsite. A large portion of the townsite north of Silver Creek is covered by mixed colluvium (Qcol), derived predominantly from underlying rock formations. The mixed colluvium locally contains a component of slope wash material (Qtw) probably derived from the ridge east of town. The Qtw rock fragments tend to be less angular and more heterogeneous than the locally derived Qcol component, due to greater transport distance.

The Quaternary alluvial deposits along Silver Creek and the Dolores River have been derived from large source areas and undergone extensive mixing of rock types. These Qal deposits may contain rock components derived from mining activity as well as natural rock components.

The surficial deposits derived from human activity include: mine dump material (wrc, wrlp and wru); mill tailings (t); smelter slag (s); coal cinders and asphalt pavement. In some areas, these materials are mixed with naturally occurring surficial deposit materials.

## GEOCHEMICAL RESULTS

### ROCK OUTCROP SAMPLES

Geochemical results for 24 rock chip outcrop samples are listed in Table 1. The samples are subdivided according to rock type. The results show relatively high concentrations of the selected metals in all four of the rock types sampled. Range and mean metal concentrations for the 24 rock samples in milligram per kilogram (mg/kg) are listed in Table 2.

**TABLE 2**  
**RANGE AND AVERAGE METAL CONCENTRATIONS IN**  
**BEDROCK OUTCROPS**  
**Rico, Colorado**

	Average	Minimum	Maximum
As	16.5	2.5	80.2
Cd	30.8	0.31	322
Cu	371	31.6	1,640
Pb	3,937	13.1	39,700
Mn	6,120	168	33,200
Ag	11.9	0.41	66.7
Zn	6,148	63.2	42,500

**TABLE 1**  
**ROCK OUTCROP SAMPLES: RICO DISTRICT, COLORADO**

SAMPLE NUMBER	SAMPLE DESCRIPTION	As (mg/Kg)	Pb (mg/Kg)	Mn (mg/Kg)	Cd (mg/Kg)	Cu (mg/Kg)	Zn (mg/Kg)	Ag (mg/Kg)
	<b>Leadville Ls.</b>							
901		2.5	70.7	815	1.16	123	195	0.424
902		2.5	38.7	378	0.77	90.1	133	0.423
903		2.5	18.7	213	0.321	126	63.2	0.428
904		2.5	13.1	177	0.319	99.5	74.8	0.425
905		2.5	19.1	337	0.32	90.8	98.2	0.429
912		5.79	54.6	530	0.309	39.4	108	0.411
913		2.5	1330	10800	26.9	31.6	2410	2.86
917		9.76	21200	13100	322	793	42500	66.7
	<b>Porphyry</b>							
906		13.6	13600	7060	1.51	846	881	64.7
909		15.9	2660	18800	157	1640	27700	29
910		9.49	39700	10800	79.7	1370	14100	60.9
918		11.8	124	652	0.375	900	162	4.55
919		7.91	84.2	2070	0.311	430	260	6.97
920		7.59	790	1400	3.99	54.5	1290	0.44
922		51.7	11400	1240	15	310	2870	8.18
	<b>Hermosa Fm.</b>							
907		35.4	691	4340	13.8	607	2010	9.25
908		36.4	289	33200	77.9	271	28100	1.38
911		13.1	367	1210	1.87	33	461	0.936
914		2.5	46.7	468	0.309	231	153	0.412
916		9.82	787	6170	0.317	132	592	0.963
921		23.4	88.9	29300	34.3	109	22800	0.44
	<b>Quartzite</b>							
915		80.2	402	867	0.324	258	243	22.2
923		7.09	242	2790	0.325	120	266	0.433
924		39	479	168	0.321	205	84.3	2.72

## SURFICIAL DEPOSIT SAMPLES

Geochemical results for the 22 surficial deposit samples are listed in Table 3. The results are subdivided into disturbed and undisturbed categories for each surficial deposit type. Range and mean metal concentrations in mg/kg for the 22 surficial deposit samples are listed in Table 4.

**TABLE 4**  
**RANGE AND AVERAGE METAL CONCENTRATIONS IN**  
**SURFICIAL DEPOSITS**  
**Rico, Colorado**

	Average	Minimum	Maximum
As	21.2	6.82	54.5
Cd	11.3	0.32	38.9
Cu	291	27	2,540
Pb	3250	67.1	49,500
Mn	2276	823	10,900
Ag	7.95	0.44	90.5
Zn	2142	109	7,420

With the exception of As, the surficial deposit mean metal concentrations are all lower than the rock outcrop mean metal values.

## CONCLUSIONS

Geological mapping indicates that the Rico townsite is located within a large area of extensive hydrothermal alteration and sulfide mineralization (metallization). Lead-zinc-silver sulfide mineralization in rock formations beneath the Rico townsite locally reached concentrations sufficient for economic mining. Geochemical sampling of rock outcrops in the northeast Rico townsite (as listed in Tables 1 and 3) shows high concentrations of As, Cd, Cu, Pb, Mn, Ag and Zn. The source of these metals is naturally occurring (predominantly sulfide) metallic minerals present in veins and replacements within the outcrops.

Quaternary colluvium, the most extensive surficial deposit in the northeast Rico townsite, also contains high concentrations of selected metals. These metals, along with the rock material comprising these deposits, were derived from the natural weathering and erosion of local, hydrothermally altered and mineralized rock formations.

The results of the geological mapping and geological sampling in the northeast Rico townsite indicate that concentrations of selected metals in surficial deposits are, with the noted exceptions, derived predominantly from geologic processes acting on natural sources.

**TABLE 3**  
**SURFICIAL DEPOSITS: RICO DISTRICT, COLORADO**

SAMPLE NUMBER	SAMPLE DESCRIPTION	As (mg/Kg)	Pb (mg/Kg)	Mn (mg/Kg)	Cd (mg/Kg)	Cu (mg/Kg)	Zn (mg/Kg)	Ag (mg/Kg)
	<b>Colluvium (Leadville Ls.) - Undisturbed</b>							
925		14.1	736	1300	12.8	132	2320	2.47
929		16.6	665	823	0.964	53.8	810	1.54
937		6.82	249	895	5.41	35.9	398	2.61
	<b>Colluvium (Porphyry) - Undisturbed</b>							
930		7.59	790	1400	3.99	54.5	1290	0.44
934		21.1	2270	1600	10.7	310	1670	5.97
935		17.3	953	10900	38.9	755	3540	6.48
	<b>Mixed Colluvium - Undisturbed</b>							
931		24.6	288	4240	21.4	392	2970	5.89
933		8.57	246	1240	6.2	34.9	940	1.39
941		15.7	3260	6720	14.8	269	3430	5.51
942		13.2	424	1340	20.4	106	4730	2.96
943		54.5	49500	2060	31.7	2540	7420	90.5
944		23	737	1240	1.72	67.2	2310	3.06
945		26.4	1570	1570	7.51	352	1640	4.81
946		24.7	2290	1500	10.9	273	2760	5.73
	<b>Mixed Colluvium - Disturbed</b>							
926		27.9	1630	1410	4.16	117	1920	2.77
932		18.5	1150	1430	11.5	119	1830	5.16
936		54.1	1920	3190	18.1	221	2660	11.6
940		19.5	1390	1700	13.8	165	2030	6.78
	<b>Fan Deposits - Undisturbed</b>							
938		17.3	598	1370	6.7	134	1190	2.36
939		17.3	554	2230	5.12	131	746	5.12
	<b>Slope Wash (East) - Undisturbed</b>							
927		13.9	67.1	1080	0.327	27	109	0.437
928		24	210	833	0.322	111	412	1.37



## REFERENCES

1. McKnight, E.T., 1974, Geology and Ore Deposits of the Rico District, Colorado. U.S.G.S. Professional Paper 723.
2. Pratt, W.P. et. al, 1969, Geological Map of the Rico Quadrangle, Dolores and Montezuma Counties, Colorado. U.S.G.S. G.Q. Map 797.



*Michael D. Russ*

## **APPENDIX A**

### **ROCK OUTCROP AND SURFICIAL SAMPLE DESCRIPTIONS**

## ROCK OUTCROP AND SURFICIAL DEPOSIT SAMPLE DESCRIPTIONS

### ROCK OUTCROP SAMPLES:

- 901 Leadville Limestone outcrop. Limestone is marbleized, with metamorphic silicate pods composed of quartz-chlorite-diopside-epidote. Boxworks in silicate pods with FeO and MnO stain. Chip sample from small outcrop on south side of Silver Creek.
- 902 Leadville Ls. outcrop in Silver Creek adjacent to the Atlantic Cable Mine. Limestone is marbleized with quartz-chlorite-diopside-garnet-epidote pods and stringers. Est. 1% garnet. weak FeO and MnO on fractures. Sample interval: 20 feet.
- 903 Leadville Ls. outcrop. Chip sample from large outcrop. Limestone is marbleized with approximately 20% quartz- garnet-diopside-chlorite-epidote pods and stringers. Weak FeO and MnO on fractures. Some black, recrystallized limestone. Sample interval approximately 50 feet.
- 904 Leadville Ls. outcrop. Limestone is marbleized with approximately 20% quartz-garnet-diopside-chlorite-epidote pods and stringers. Approximately 10% dark gray, pyritic, carbonaceous marble. Sample interval approx. 15 feet.
- 905 Leadville Ls. outcrop. Five foot chip sample. Limestone is marbleized with approx. 20% vuggy quartz-garnet-chlorite pods and stringers. Contains some pyrite and hematite, with iron and manganese oxides.
- 906 Hornblende latite porphyry. Eight foot chip sample across outcrop in road cut. Latite porphyry is dark greenish gray, strongly chloritized, with N78°W striking quartz-hematite-pyrite-galena veinlets up to 1 inch thick. Some veinlets are vuggy, with limonitic, comb quartz, pyrite, hematite, galena, iron oxides (limonite) and trace CuO staining.
- 907 Lower Hermosa Formation outcrop in new home site excavation. Five foot chip sample. Hermosa Formation, Lower Member, composed of interbedded sandstone, carbonaceous shale, and limestone, intruded by latite porphyry sills and dikes. Minor displacement faults with clay gouge exposed in outcrop. Iron and manganese oxides coating fractures.
- 908 Hermosa Formation, Lower Member (shale) outcrop. Six foot chip sample across fault zone cutting Lower Hermosa shale. Fault zone is composed of crushed, limonitic shale, and limonitic clay gouge with clasts of quartz-pyrite vein material.
- 909 Hornblende latite porphyry outcrop. Eight foot chip sample. Chloritized, pyritic latite porphyry with limonite, manganese oxides, and copper oxides on fractures.
- 910 Hornblende latite porphyry. Six foot chip sample across outcrop. Latite porphyry is dark green, chloritized, brecciated, with limonite, MnO, and CuO on fractures and in breccia matrix. Some clay altered clasts.

- 911 Hermosa Formation, Lower Member (ls.) outcrop. Approx. 15 foot chip sample. Limestone is dark gray, carbonaceous, unsilicified, with euhedral pyrite cubes up to five mm. across. Outcrop contains a few small calcite-pyrite veinlets and stringers.
- 912 Leadville Limestone outcrop. 12 foot chip sample. Limestone is gray, marbleized, with quartz-chlorite-epidote pods and lenses.
- 913 Leadville Limestone outcrop. Five foot chip sample from rubblecrop in road cut. Limestone is greenish-gray, marbleized, with concentrically banded quartz-chlorite lenses.
- 914 Hermosa Fm., lower member (sandstone) outcrop. Small sandstone outcrop in Silver Creek. Sandstone is dark green, fine grained, hard, micaceous, and chloritic, with a few narrow silicified fractures. Weakly pyritic.
- 915 Quartzite (formation unknown) outcrop. Five foot chip sample across small isolated outcrop. Outcrop has strong milky quartz veining with large pods and lenses of hematite-pyrite.
- 916 Hermosa Fm., lower member (sandstone) outcrop. Chip sample from small outcrop in Rico townsite. Sandstone is dark green, fine grained, hard, weakly chloritic and pyritic. Contains a few narrow quartz-pyrite stringers. Weak manganese and iron oxides on fractures. Similar to sample 914.
- 917 Leadville Ls. outcrop. Six foot chip sample across outcrop at caved Shamrock adit portal. Limestone is strongly chloritized and vuggy. Contains pods and blebs of pyrite-hematite-sphalerite-galena.
- 918 Hornblende latite porphyry outcrop. Three foot chip sample from outcrop on west bank of Dolores River. Latite porphyry is intensely pyritized and silicified, with pyrite cubes up to 1 cm. across. Trace specular hematite. Strong iron oxides through.
- 919 Hornblende latite porphyry outcrop. 20 foot chip sample on west bank of Dolores River. Latite porphyry is intensely pyritized and silicified. Contains strong disseminated quartz-pyrite flooding. Strong pyrite. Trace CuO.
- 920 Hornblende latite porphyry. 20 foot chip sample from outcrop in road cut. Sample continues south from sample 906. Latite porphyry is dark greenish-gray, pyritic, chloritized, with N78°W trending quartz-pyrite-hematite-galena veinlets.
- 921 Hermosa Fm., lower member (shale), outcrop. 15 foot chip sample across outcrop adjacent to fault. Shale is dark gray, strongly baked and shattered, with strong iron and manganese oxides on fractures.

- 922 Hornblende latite porphyry outcrop. Five foot chip sample from road cut. Latite porphyry is sheared and broken, with strong iron oxides on fractures.
- 923 Larsen quartzite outcrop. Five foot chip sample from outcrop in road cut. Quartzite is dark reddish brown, fine to coarse grained, dense, hard, and iron stained. Weakly pyritic.
- 924 Larsen Quartzite outcrop. Eight foot chip sample. Quartzite is medium gray to brown, massive, with 1/8 inch to 1 inch quartz- pyrite veinlets. Fractures are coated with iron oxides and specular hematite. Slickensides present on fractures.

#### SURFICIAL DEPOSIT SAMPLES

- 925 Colluvium - Leadville Limestone. Undisturbed, dark brown soil and mixed rock fragments (predominantly Leadville Ls.). Sample depth is six to eight inches. Sample from below Leadville Ls. outcrop (sample 912).
- 926 Mixed colluvium (Qcol) - disturbed. Soil and mixed rock fragments from fire hydrant excavation. Rock fragments are angular to sub rounded. Sample depth is 12 to 18 inches.
- 927 Slope Wash (Qtw) - Undisturbed. Sample collected from water main excavation cut. Sample is angular to sub-rounded fragments of igneous porphyry, sandstone, quartzite, and limestone, in a red, clayey, silty matrix. Sample depth is 12 to 18 inches.
- 928 Slope Wash (Qtw) - Undisturbed. Sample is from water main excavation cut on Newman Hill. Sample depth is 36 to 48 inches. Sample is angular to sub-rounded fragments of igneous porphyry, sandstone, quartzite, and limestone, in red silty, clayey matrix. Sample is similar to sample 927, but deeper.
- 929 Colluvium - Leadville Ls.(Qcol-MI),Undisturbed. Soil and mixed rock fragments (predominantly Leadville Ls.) from below Leadville Ls. outcrop. Sample depth is six to eight inches.
- 930 Colluvium - Hornblende latite porphyry, Undisturbed. Sample depth is 3 to 6 inches. Sample taken just above latite porphyry bedrock outcrop (sample 920).
- 931 Mixed colluvium. Undisturbed. Soil and rock fragments predominantly of Hermosa Shale and limestone. Sample depth 6 to 8 inches. Sample from "C" soil horizon.
- 932 Mixed colluvium. Disturbed. Sample from utility right-of-way in front of log cabin. Sample is dark brown soil and mixed rock fragments. Sample depth is 3 to 6 inches.
- 933 Mixed Quaternary Colluvium (Qcol). Undisturbed. Hornblende latite porphyry. Colluvium is dark brown soil and mixed rock fragments (predominantly latite porphyry). Sample depth is 6 to 8 inches.

- 934 Colluvium - Hornblende latite porphyry. Undisturbed. Sample is reddish-brown soil with mixed rock fragments (predominantly latite porphyry). Sample depth is 6 to 10 inches, from road cut. Soil contains strong iron oxides.
- 935 Colluvium - Hornblende latite porphyry. Undisturbed sample from road cut. Sample is dark brown soil with mixed rock fragments (predominantly latite porphyry). Sample depth is 6 to 10 inches.
- 936 Mixed colluvium (Qcol). Disturbed. Sample is dark brown soil with mixed rock fragments. Sample depth is 3 to 6 inches from fire hydrant on corner.
- 937 Quaternary Colluvium - Leadville Ls. (Qcol - Ml). Undisturbed sample directly down slope from Leadville Ls. outcrop sample 903. Sample is dark brown soil mixed with Leadville ls. fragments. Sample depth is 4 to 8 inches.
- 938 Quaternary fan deposit - Undisturbed (Qf). Sample depth is 24 to 36 inches. Sample taken from utility excavation in undisturbed material. Sample is unconsolidated, stratified sand, silt, clay and gravel of mixed composition. Sample exhibited graded bedding.
- 939 Quaternary fan deposit - Undisturbed? Sample is dark brown soil with mixed rock fragments. Sample depth is 10 to 12 inches.
- 940 Mixed Quaternary Colluvium (Qcol) - Disturbed. Dark brown soil and small mixed rock fragments from animal burrow in vacant lot. Sample depth is less than 1 ft.
- 941 Mixed Quaternary Colluvium (Qcol) - Undisturbed. Sample is gray soil with mixed rock fragments (C-soil horizon). Sample depth is 6 to 10 inches.
- 942 Mixed Quaternary Colluvium (Qcol) - Undisturbed sample from "A" soil horizon. Sample is dark brown soil with a few mixed rock fragments. Sample depth is 8 to 12 inches.
- 943 Mixed Quaternary Colluvium (Qcol) - Undisturbed. Sample collected from new home excavation from a depth of 6 to 8 ft. Sample is composed of soil, sand, and mixed rock fragments, including: igneous porphyry, quartzite, sandstone, carbonate, and a few mineralized fragments. The mineralized fragments are subrounded, brown to black clasts of iron oxides and sulfides. One clast was CuO-stained.
- 944 Mixed Quaternary Colluvium (Qcol) - Undisturbed sample from driveway cut. Sample is grayish soil and mixed rock fragments ("C" soil horizon). Sample depth is 18 to 24 inches.
- 945 Mixed Quaternary Colluvium (Qcol) - Undisturbed. Sample is from depth of 36 to 48 inches in foundation excavation of log cabin. Sample is composed of soil, silt, sand, and angular to subrounded fragments of mixed rock types. Matrix is tan to brown, limonitic.

- 946 Mixed Quaternary Colluvium (Qcol) - Undisturbed. Sample depth is 36 to 48 inches. Sample is from foundation excavation behind church. Sample is composed of sand, silt, soil, and fragments of mixed rock types.

**APPENDIX B**

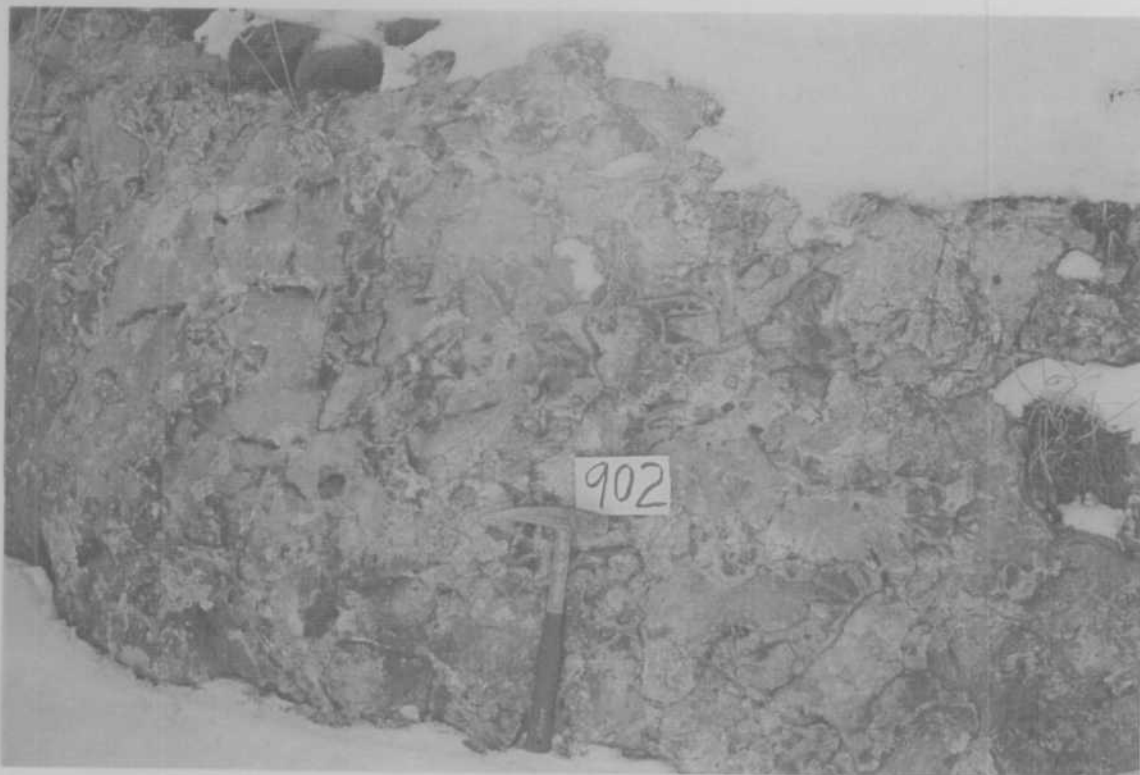
**SAMPLE SITE PHOTOGRAPHS**



# Color Photo(s)

The following pages  
contain color that does  
not appear in the  
scanned images.

To view the actual images, please  
contact the Superfund Records  
Center at (303) 312-6473.



SAMPLE 902: LEADVILLE LIMESTONE OUTCROP



SAMPLE 903: LEADVILLE LIMESTONE OUTCROP



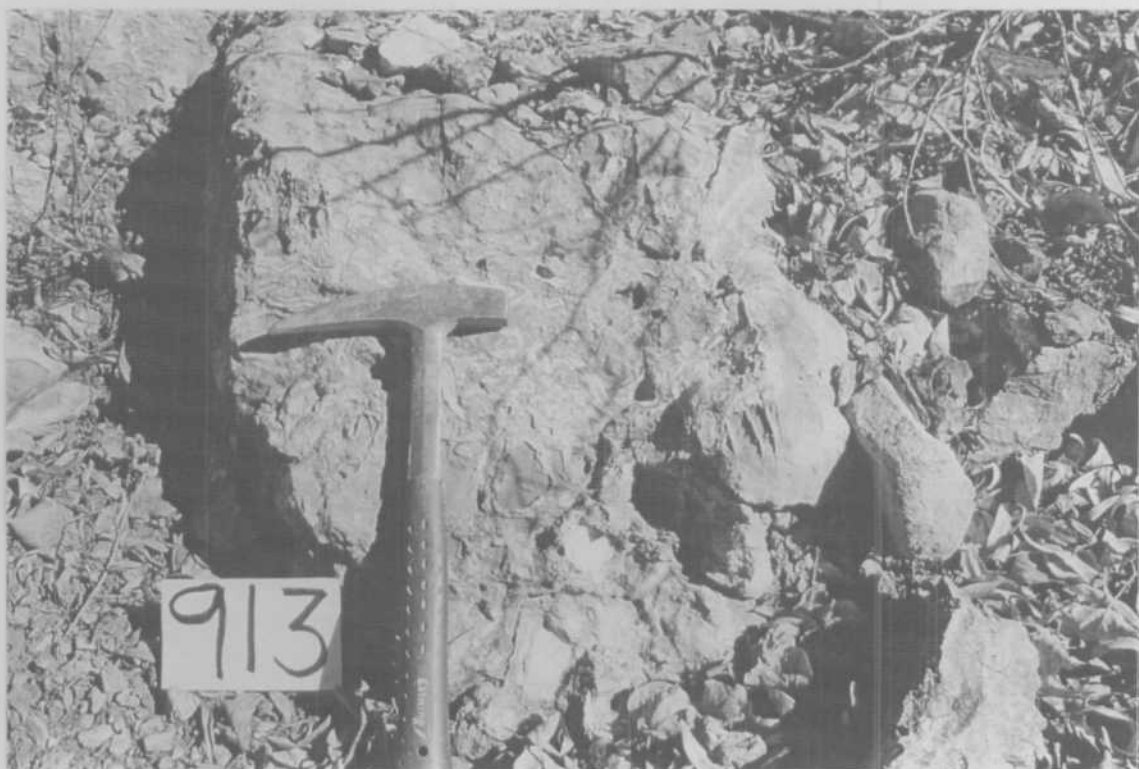
SAMPLE 904: LEADVILLE LIMESTONE OUTCROP



SAMPLE 905: LEADVILLE LIMESTONE OUTCROP



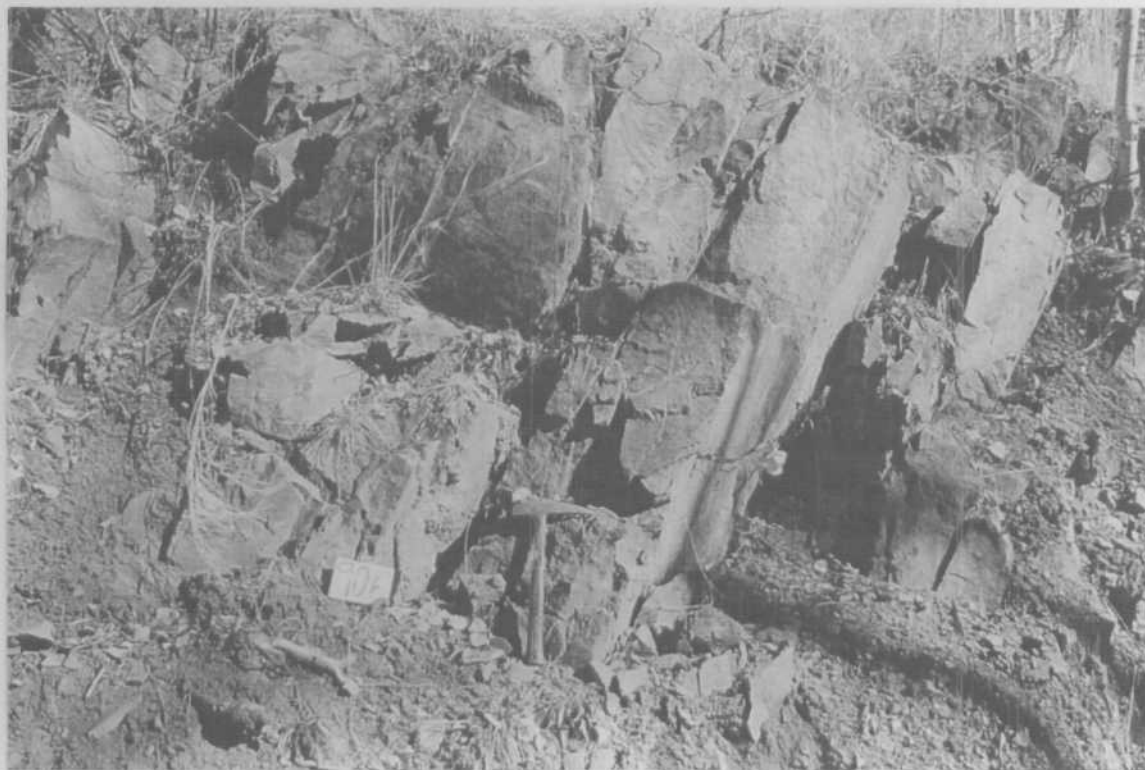
SAMPLE 912: LEADVILLE LIMESTONE OUTCROP



SAMPLE 913: LEADVILLE LIMESTONE OUTCROP

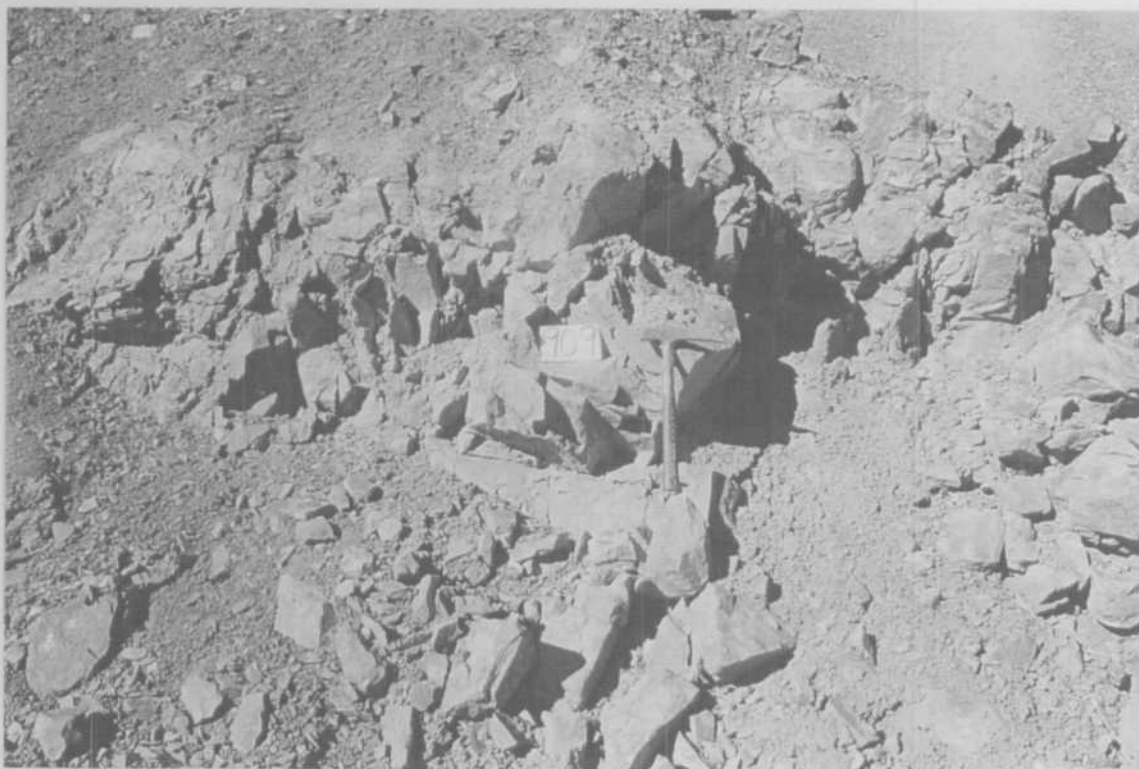


SAMPLE 919: HORNBLENDE LATITE PORPHYRY OUTCROP



SAMPLE 906: HORNBLENDE LATITE PORPHYRY OUTCROP





SAMPLE 909: HORNBLENDE LATITE PORPHYRY OUTCROP



SAMPLE 910: HORNBLENDE LATITE PORPHYRY OUTCROP



SAMPLE 920: HORNBLENDE LATITE PORPHYRY OUTCROP



SAMPLE 908: HERMOSA FORMATION, LOWER MEMBER (SHALE) OUTCROP



SAMPLE 907: LOWER HERMOSA FORMATION OUTCROP





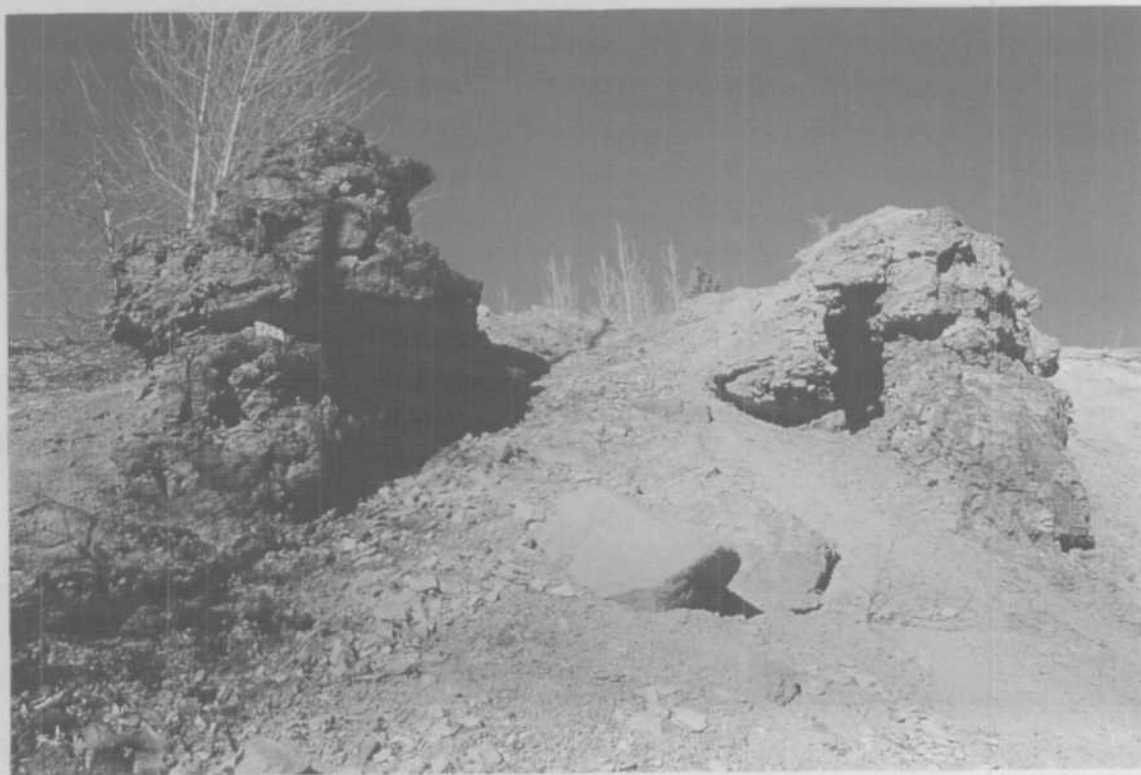
SAMPLE 911: HERMOSA FORMATION, LOWER MEMBER (LIMESTONE) OUTCROP



SAMPLE 914: HERMOSA FORMATION, LOWER MEMBER (SANDSTONE) OUTCROP



SAMPLE 916: HERMOSA FORMATION, LOWER MEMBER (SANDSTONE) OUTCROP



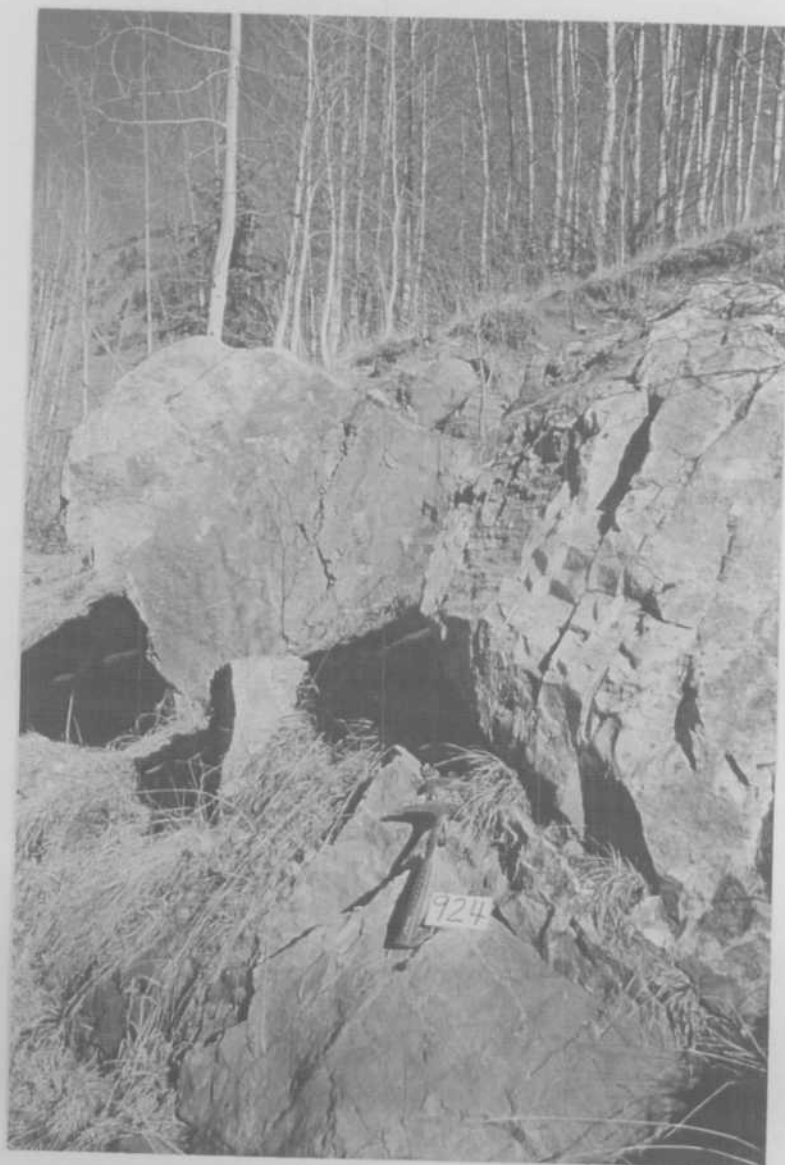
SAMPLE 921: HERMOSA FORMATION, LOWER MEMBER (SHALE) OUTCROP



SAMPLE 915: QUARTZITE OUTCROP (FORMATION UNKNOWN)



SAMPLE 923: LARSEN QUARTZITE OUTCROP



SAMPLE 924: LARSEN QUARTZITE OUTCROP





SAMPLE 926: MIXED COLLUVIUM - DISTURBED



SAMPLE 927: SLOPE WASH - UNDISTURBED



SAMPLE 928: SLOPE WASH - UNDISTURBED



SAMPLE 929 (904): COLLUVIUM - LEADVILLE LS. (LEADVILLE LS.)



SAMPLE 934: COLLUVIUM - HORNBLende LATITE PORPHYRY

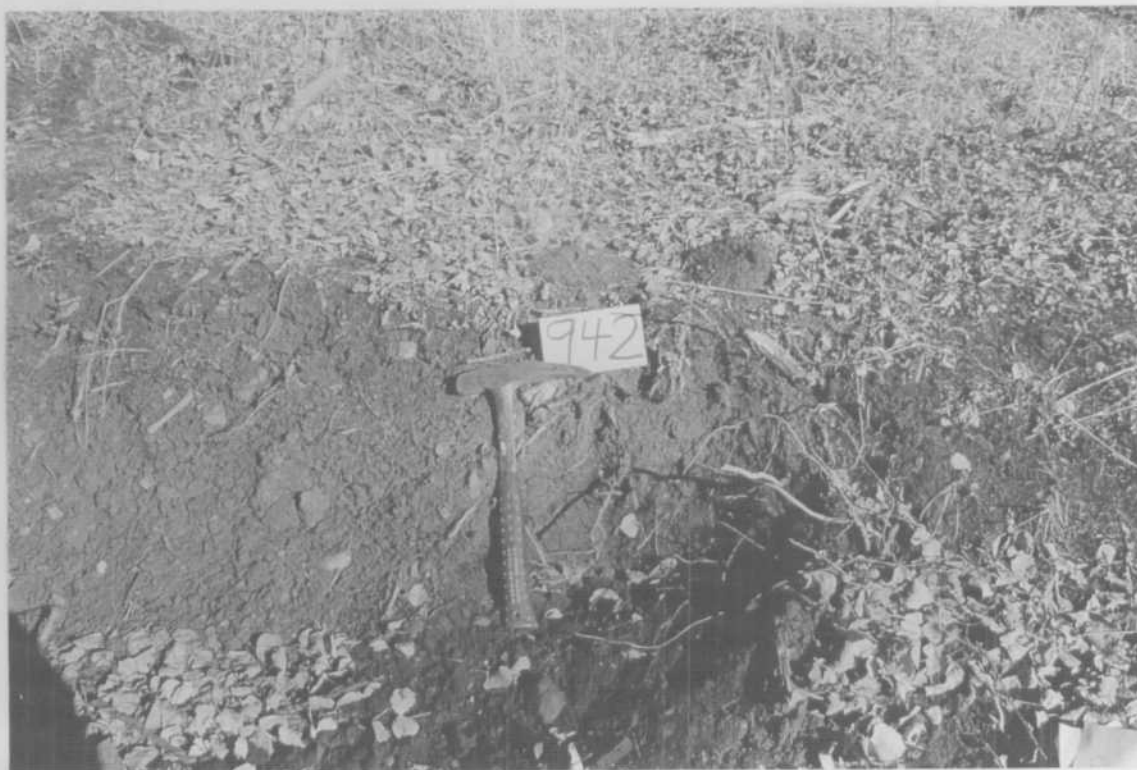


SAMPLE 935: COLLUVIUM - HORNBLENDE LATITE PORPHYRY





SAMPLE 936: MIXED COLLUVIUM - DISTURBED



SAMPLE 942: MIXED QUATERNARY COLLUVIUM - UNDISTURBED



SAMPLE 939: QUATERNARY FAN DEPOSIT - UNDISTURBED (?)



SAMPLE 943: MIXED QUATERNARY COLLUVIUM - UNDISTURBED



SAMPLE 943: MIXED QUATERNARY COLLUVIUM - UNDISTURBED



SAMPLE 943: MIXED QUATERNARY COLLUVIUM - UNDISTURBED



SAMPLE 943: MIXED QUATERNARY COLLUVIUM - UNDISTURBED



SAMPLE 944: MIXED QUATERNARY COLLUVIUM - UNDISTURBED





SAMPLE 945: MIXED QUATERNARY COLLUVIUM - UNDISTURBED



SAMPLE 946: MIXED QUATERNARY COLLUVIUM - UNDISTURBED



**TARGET SHEET**  
EPA REGION VIII  
**SUPERFUND DOCUMENT MANAGEMENT SYSTEM**

DOCUMENT NUMBER: 1012201

SITE NAME: RICO ARGENTINE/RICO POND

DOCUMENT DATE: 01/01/1996

**DOCUMENT NOT SCANNED**

Due to one of the following reasons:

- ☐ PHOTOGRAPHS
- ☐ 3-DIMENSIONAL
- ☒ OVERSIZED
- ☐ AUDIO/VISUAL
- ☐ PERMANENTLY BOUND DOCUMENTS
- ☐ POOR LEGIBILITY
- ☐ OTHER
- ☐ NOT AVAILABLE
- ☐ TYPES OF DOCUMENTS NOT TO BE SCANNED  
(Data Packages, Data Validation, Sampling Data, CBI, Chain of Custody)

DOCUMENT DESCRIPTION:

PLATE 1 - GEOLOGICAL MAP

PLATE 2 - SURFICIAL GEOLOGY MAP

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